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# Library Scholars Grant Presentation

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# **Library Scholars Grant Presentation**

Monday, March 29, 2010

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## **Project Summary**

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The primary goal of this project is to document the historical development of computer engineering as a distinct academic discipline and professional specialty in the United States, from the origins of the field in the 1940s to the early 2000s. My research is more specifically focused on three main contexts: a) the computer industry, b) professional organizations and sub-groups, and c) academic departments, degree programs, and curricula.



# Research Plan

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## Source Materials

- Unpublished papers, correspondence, oral histories from key historical figures
- Pre-prints and other unpublished papers from professional societies, conferences
- Reports, meeting minutes, membership data from relevant professional societies
- Business records and product information from various computer companies
- Unpublished documents and reports from academic departments and committees

## Proposed Research

- IEEE History Center  
New Brunswick, NJ
- Computer History Museum  
Mountain View, CA
- Linda Hall Library  
Kansas City, MO
- Charles Babbage Institute  
Minneapolis, MN



# Research Plan

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## Actual Research

- ~~IEEE History Center~~  
~~New Brunswick, NJ~~
- ~~Computer History Museum~~  
~~Mountain View, CA~~
- Linda Hall Library  
Kansas City, MO
- Charles Babbage Institute  
Minneapolis, MN
- Lotfi Zadeh  
Berkeley, CA



## Linda Hall Library of Science, Engineering, and Technology

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- “An independent public library of science, engineering and technology.”
- Kansas City, Missouri (on UMKC-MO campus)
- Opened in 1946
- Growth of Collection
  - American Academy of Arts and Sciences (1946)
  - Franklin Institute (1985)
  - Engineering Sciences Library (1995)
- Relevant Resources
  - IEEE Computer Society Repository, 1966-1973
  - AIEE Preprints and Unpublished Papers, 1922-1957
  - IEEE Preprints and Unpublished Papers, 1958-1989



# Charles Babbage Institute

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- University of Minnesota Libraries, Minneapolis, MN
- Established in 1978, affiliation with University of Minnesota dates back to 1980.
- CBI collects, preserves, and makes available primary source materials relating to the history of information technology. The collection includes corporate records, manuscript materials, records of professional associations, oral history interviews, trade publications, periodicals, obsolete manuals and product literature, photographs, films, videos, and reference materials.
- Relevant resources: Materials from universities (Berkeley, Michigan, Stanford), personal files, company files.

# Lotfi Zadeh

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- Professor, Electrical Engineering and Computer Science, UC-Berkeley
- Probably best known for contributions in the area of fuzzy logic
- Key historical figure in field of computer engineering
  - "Thinking Machines" (1951)
  - COSINE Committee (late 1960s)
  - Head of EECS at Berkeley (1960s-1970s)



## **“A New Field in Electrical Engineering”: The Origins and Early History of Computer Engineering in the United States**

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This paper examines the origins and early history of the field of computer engineering in the United States from the mid-1940s to mid-1950s. It is based on a wide range of primary and secondary sources, and draws theory from the sociology of professions. The paper begins by describing how various configurations of experts came together to build the first high-speed digital computers. It then turns to a series of conferences and publications to highlight the computer field's early professional composition and boundaries. These sections also examine the activities of key professional organizations, and probe the origins of the terms “computer engineer” and “computer engineering.” Finally, the paper examines the institutionalization of computer engineering identities in the 1950s, especially in the growing commercial computer industry. The main goal of this paper is to show how the jurisdiction of the engineering profession expanded to include the design and development of computer hardware.

(Recently submitted for publication in *IEEE Annals of the History of Computing*.)

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Engineering Research Associates, Inc., "Digital Computer Engineers," *Proc. IRE*, vol. 40, no. 12, 1952, p. 132A.

# Sociotechnical Settlement and Mediation in a System of Technical Societies: A Relational History of the IEEE Computer Society and ACM, circa 1967-1977

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*Abstract*—The IEEE Computer Society has long occupied a unique position between its parent organization (the IEEE, formerly IRE and AIEE) and the Association for Computing Machinery (ACM). In this paper I examine how this position was maintained from about 1967 to 1977. More specifically, I show how various structures and processes of sociotechnical settlement and mediation created stability in this system of technical societies, even in the midst of rapid technological and institutional change. I develop this case by presenting evidence from three technical areas, namely microprogramming, computer architecture, and software engineering. My analysis is based on extensive archival research, and draws theory and method from the history of technology and science and technology studies.

*Keywords*—ACM; computer architecture; Computer Society; history; IEEE; microprogramming; sociotechnical; software engineering

and technology studies. I begin with the case of microprogramming.

## II. MICROPROGRAMMING

British computer pioneer Maurice Wilkes is often credited with introducing the term “microprogramming” in 1951, in reference to a new type of computer design with a modifiable rather than fixed set of operating instructions [2]. This approach made it much easier for computer designers and programmers to create and modify a computer’s core operating codes. Through the 1950s, limitations in memory technology and rearguard traditions of computer design stalled the commercial realization of the idea. Yet the feasibility of the concept was bolstered when the microprogrammed EDSAC 2 went into operation at Wilkes’ own University of Cambridge in 1958 [3].

In the early-1960s, IBM started implementing



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